Claims

I claim:

1. A center beam rail road car comprising:
   a deck structure carried by rail car trucks, said deck structure having first and second end portions and a medial portion lying between said first and second end portions, said medial portion being stepped downward relative to said end portions;
   first and second end bulkheads extending upwardly from opposite ends of said deck structure;
   a central beam assembly running lengthwise along said rail road car between said bulkheads, said beam assembly standing upwardly of said deck structure; and
   said bulkheads extending to a greater height relative to top of rail than said central beam assembly.

2. The center beam car of claim 1 wherein said bulkheads extend to a height extending beyond AAR plate 'C'.

3. The center beam car of claim 2 wherein said bulkheads fall within AAR Plate 'F'.

4. The center beam rail road car of claim 1 wherein:
   said rail road car has a loading height limit, H1, measured upwardly from said medial deck portion;
   said central beam assembly has an uppermost portion lying at a height, H2, measured upwardly from said medial deck portion; and
   H1 exceeds H2 by at least 33 - 5/8 inches.

5. The center beam rail road car of claim 4 wherein said loading height limit is within AAR Plate F.

6. The center beam car of claim 5 wherein said loading height limit exceeds AAR plate C.

7. The center beam car of claim 1 wherein said bulkheads have a height, H1, measured relative to said medial deck portion, and said central beam assembly has a height H2 measured relative to said central beam assembly; and the ratio of H1 to H2 is at least as great as 4 : 3.

8. The center beam car of claim 7 wherein the ratio of H1 to H2 is at least as great as 5 : 4.

9. The center beam car of claim 7 wherein said medial portion of said deck structure is stepped downward relative to said end portions by a third height, H3, and the ratio of (H1 – H3) : H2 is at least as great as 3 : 2.

10. The center beam car of claim 8 wherein said medial portion of said deck structure is stepped downward relative to said end portions by a third height, H3, and the ratio of (H1 – H3) : H2 is at least as great as 4 : 3.

11. The center beam car of claim 1 wherein said medial portion of said deck is stepped downward relative to one of said end portions of said deck a distance of at least 30 inches.

12. The center beam car of claim 11 wherein said medial portion of said deck is stepped downward relative to one of said end portions of said deck a distance of at least 33 5/8 inches.

13. The center beam car of claim 11 wherein said bulkheads exceed said central beam assembly in height by a distance that is at least 33 – 5/8 inches.

14. The center beam rail road car of claim 1, wherein said central beam assembly includes a top chord member extending between said end bulkheads.

15. The center beam rail road car of claim 14 wherein said top chord member is a beam having smooth sides, said smooth sides each presenting a smooth surface against which to place lading.

16. The center beam rail road car of claim 11 wherein said central beam assembly includes at least one post standing upwardly of said deck structure, and said top chord is wider than said at least one post.

17. The center beam rail road car of claim 16 wherein said post presents a smoothly radiused surface to lading placed next to said central beam assembly.

18. The center beam rail road car of claim 1 wherein said medial deck portion lying between said two trucks is at least 28' - 0" long.

19. The center beam rail road car of claim 1 wherein said medial deck portion lying between said two trucks is at least 40' - 0" long.

20. The center beam car of claim 1 wherein said rail road car further comprises:
a center sill extending along said rail road car, said center sill having an upper flange, a lower flange, and at least one upright web connecting said upper and lower flanges;
said upper flange lying at a height corresponding to said first end portion of said deck structure; and
said lower flange lying at a height corresponding to said medial portion of said deck structure.

21. The center beam rail road car of claim 1 wherein:
said car has a pair of side sills extending along said deck structure;
said side sills each have a medial side sill portion mounted to said medial deck portion, said medial side sill portion having a first depth of section;
said side sills each have end side sill portions mounted to said end deck portions, said end side sill portions having a second depth of section; and
said first depth of section is less than said second depth of section.

22. The center beam rail road car of claim 1 wherein said end deck portions each have a lading interface upon which lading can be carried, and said respective lading interfaces each lie at a height greater than 42 inches above top of rail.

23. The center beam rail road car of claim 22 wherein a center sill extends along said deck structure, said center sill includes an end portion extending longitudinally outboard of one of said trucks, said end portion of said center sill has an upper flange lying at a height corresponding to said height of said lading interfaces of said end portions of said deck structure.

24. The center beam rail road car of claim 1 wherein:
a center sill extends along said deck structure;
said center sill has an end portion extending longitudinally outboard thereof;
said end portion of said center sill includes a top flange and a pair of spaced apart webs extending downwardly of said top flange;

said webs define sides of a draft sill portion of said center sill;

said end portion of said center sill includes a plate mounted between said webs below said top flange; and

said plate defining a top cap of said draft sill portion of said center sill.

25. The center beam rail road car of claim 24 wherein said said top flange of said end portion of said center sill lies at a height greater than 42 inches above top of rail, and said end portions of said deck structure include deck plates mounted to said top flange.

26. The center beam rail road car of claim 1, wherein:

said car has a pair of side sills extending along said deck structure;

said side sills each have a side sill medial portion mounted to said medial decking portion, said medial side sill portion having a first depth of section;

said side sills each have side sill end portions mounted to said end decking structures, said end side sill portions having a second depth of section;

each of said side sills has a knee joining said side sill medial portion to each of said side sill end portions;

each said knee has a longitudinally inboard flange, a longitudinally outboard flange, and webbing extending therebetween;

said longitudinally outboard flange has a lower extremity and an upper extremity; and

said lower extremity lies at a longitudinally inboard station relative to said upper extremity.

27. The center beam rail road car of claim 1 wherein:

said car has a pair of side sills extending along said deck structure;

said side sills each have a medial side sill portion mounted to said medial decking portion;

said side sills each have end side sill portions mounted to said end decking structures; and

said medial side sill portion has a medial portion side sill web extending from a first margin to a second margin, said first margin lying at a greater height than said second margin, and said first margin lying a further distance transversely outboard than said second margin.

28. The center beam rail road car of claim 25 wherein said medial decking portion has at least one lading securement apparatus mounted to said medial portion side sill web.

29. The center beam rail road car of claim 1 wherein said medial portion of said deck structure is connected to said first end portion of said deck structure at a transition member,

said transition member including a foothold to facilitate ascent of said first end portion of said deck structure from said medial portion of said deck structure.

30. The center beam rail road car of claim 27 wherein said transition member includes a vertical transition bulkhead extending between said medial portion of said deck structure to said first end portion of said deck structure, and said foothold is a step formed in said vertical transition bulkhead.

31. The center beam rail road car of claim 1 further comprising;

a center sill running along said deck structure;

said first end portion of said deck structure having a first end deck sheet;

said center sill having a first center sill end portion, said center sill end portion having an upper flange and a pair of spaced apart webs extending downwardly from said upper flange;

a draft pocket cap plate mounted within said first center sill end portion between said pair of spaced apart webs, said draft pocket cap plate lying at a lower level than said deck sheet; and

a draft pocket defined between said pair of webs and below said draft pocket cap plate.

32. The center beam rail road car of claim 31 wherein a first bolster extends laterally from said main sill to support said first end portion of said deck structure, said bolster having a upper flange extending in a plane lying at a greater height from top of rail than said draft pocket cap plate.

33. The center beam rail road car of claim 31 wherein:

said center sill has a central portion adjacent to said medial portion of said decking structure and first and second end portions adjacent to said first and second end portions of said decking structure;

said central portion of said center sill has an upper flange, a pair of spaced apart webs extending downwardly from said upper flange and a lower flange mounted to said webs, said upper flange, said lower flange and said webs of said center sill defining a hollow box beam;

said medial portion of said deck structure has a deck sheet; and

said lower flange of said central portion of said center sill is mounted at a level corresponding to said deck sheet of said medial portion of said decking structure.

34. The center beam car of claim 33 wherein said center sill has a depth of section between said upper flange and said bottom flange of at least 30 inches.

35. The center beam car of claim 31 wherein:
side sills extend along either side of said deck structure;
said side sills each have a medial portion running along said medial portion of said deck structure, and first and second end portions running along said first and second end portions of said deck structure; and
said end portions of said side sills have a greater depth of section than said medial portions of said side sills.

36. A center beam rail road car comprising:
a deck structure carried on railcar trucks for rolling motion in a longitudinal direction, a pair of first and second bulkheads extending upwardly of said deck structure at either end thereof, and a central beam assembly standing upwardly of said deck structure and running lengthwise along said deck structure between said bulkheads;
said central beam assembly having a top chord spaced upwardly from said deck structure, said top chord being rigidly connected to said bulkheads;
said first bulkhead having a bulkhead sheet having a first face oriented longitudinally inboard, and a central vertical post mounted longitudinally outboard of said bulkhead sheet, said central vertical post including a pair of first and second spaced apart webs extending longitudinally outboard of said sheet;
said central beam assembly including a shear panel extending longitudinally inboard of said bulkhead sheet, said shear panel lying in a plane offset from said webs;
said bulkhead having transverse beams mounted between said webs of said central vertical post;
said bulkhead having at least one shear panel extension member mounted to said bulkhead sheet and extending longitudinally outboard therefrom, said shear panel extension being connected to at least one of said transverse beams.

37. The center beam rail road car of claim 36 wherein said shear panel extension is co-planar with said shear panel.

38. The center beam rail road car of claim 36 wherein said central vertical post includes a flange spaced longitudinally from said bulkhead sheet, said flange, said sheet and said

webs of said vertical post forming a hollow box section.

39. The center beam rail road car of claim 36 wherein said transverse beams form closed hollow sections when mounted to said bulkhead sheet.

40. The center beam of claim 36 wherein said transverse beams are channel sections having toes mounted to said bulkhead sheet.

41. The center beam rail road car of claim 36 wherein at least one of said transverse beams includes arms extending transversely outboard of said webs of said vertical post along said bulkhead sheet.

42. The center beam car of claim 36 wherein said central beam assembly includes a top chord mated with said bulkhead in line with said central vertical post, and said bulkhead includes a cross beam mated to said central vertical post at a level corresponding to said top chord.

43. The center beam car of claim 42 wherein said cross beam lies longitudinally outboard of said bulkhead sheet and includes an arm having a proximal portion mounted to said vertical post, and a distal portion lying transversely outboard thereof, said arm being tapered to a smaller section at said distal portion than at said proximal portion.

44. A center beam rail road car comprising:

a deck structure carried on railcar trucks for rolling motion in a longitudinal direction, a pair of first and second bulkheads extending upwardly of said deck structure at either end thereof, and a central beam assembly standing upwardly of said deck structure and running lengthwise along said deck structure between said bulkheads;

said central beam assembly having a top chord spaced upwardly from said deck structure at a first height relative to top of rail, said top chord being rigidly connected to said bulkheads;

said first bulkhead having a bulkhead sheet having a first face oriented longitudinally inboard, and a central vertical post mounted longitudinally outboard of said bulkhead sheet;

said central beam assembly includes a top chord mated with said bulkhead in line with said central vertical post;

said first bulkhead has a cross beam mated to said central vertical post at a height

corresponding to said first height of said top chord; and

said cross beam lies longitudinally outboard of said first bulkhead sheet and includes a pair of first and second extending to either side of said central vertical post, each of said arms having a proximal portion mounted to said vertical post, and a distal portion lying transversely outboard thereof, each said arm being tapered to a smaller section at said distal portion than at said proximal portion;

whereby the connection of said top chord to said first bulkheads is reinforced both vertically and transversely.

45. The center beam car of claim 44 wherein said first bulkhead extends to a second height relative to top of rail, said second height being greater than said first height.

46. A center beam rail road car comprising:

a deck structure carried by rail car trucks, each of said cars having a truck center;

a central beam assembly running lengthwise along said rail road car, said central beam assembly standing upwardly of said deck structure;

a center sill supporting at least a portion of said deck structure, said center sill extending longitudinally above at least one of said trucks;

said center sill having a top flange and a pair of spaced apart webs extending downwarly from said top flange;

a bolster supporting at least a portion of said deck structure, said bolster extending laterally from said center sill abreast of said truck center;

said central beam assembly having a post extending vertically upward above at least one of said truck centers, said post having a first pair of flanges each lying in a longitudinal vertical plane, and a second pair of flanges each lying in a cross-wise vertical plane; and

said post being mounted to said center sill in a mounting arrangement having flange continuity above and below the level of the center sill top flange.

47. The center beam car of claim 46 wherein:

said bolster has a pair of longitudinally spaced vertical webs;

said bolster includes gussets mounted between said webs of said center sill in line with said spaced vertical webs to provide web continuity through said center sill; and

first and second longitudinal gussets extend in vertical spaced apart planes between said spaced vertical webs, said first and second longitudinal gussets providing flange continuity to said first pair of flanges of said post.

48. The center beam car of claim 46 wherein:

said bolster has a pair of longitudinally spaced vertical webs; said bolster includes gussets mounted between said webs of said center sill in line with said spaced vertical webs to provide web continuity through said center sill;

first and second longitudinal gussets extend in vertical spaced apart planes between said spaced vertical webs, said first and second longitudinal gussets providing flange continuity to said first pair of flanges of said post; and

third and fourth cross-wise gussets are mounted between said first and second gussets, said thrid and fourth gussets to provide flange continuity to said second pair of flanges of said post.